

The following listing of claims will replace all prior listings of claims in the application.

LISTING OF CLAIMS

Claim 1 (currently amended):

A system for reaction of a nucleic acid comprising:

a reaction unit comprising

a nucleic acid probe array substrate having a nucleic acid probes immobilized in an array on a surface of the substrate,

a cover member for forming a chamber with said probes immobilized on said surface, wherein a liquid can be filled into the chamber so as to apply said liquid to each of said probes, and

a heat conduction member for improving thermal diffusion in the liquid within said chamber, the heat conduction member being in contact with said substrate or said cover member; and

a temperature control block for controlling the temperature of said heat conduction member,

wherein said temperature control block includes a plurality of holes for inserting microtubes therinto, and

wherein said heat conduction member being for filling the plurality of holes including a leg, the leg is adapted to be inserted into and in close contact with one of the plurality of holes of said temperature control block, which is located on a back surface of

said substrate, and the temperature control block being in contact with said substrate or said cover member and

wherein said heat conduction member is formed of resin or a composite of metal and resin.

Claim 2 (previously presented): A system for reaction of a nucleic acid according to claim 1, wherein said temperature control block is a heat block adapted to receive a microtube.

Claim 3 (canceled).

Claim 4 (withdrawn): A method for detecting genes by utilizing as a detection means a substrate to the substrate surface of which a plurality of nucleic-acid probes containing single-stranded nucleic acid fragments having a complementary sequence in respect to a target DNA have been immobilized in order that the target DNA contained in a specimen is detected according to hybridization; the method comprising:

disposing a heat-conductive material on the back of the substrate to the substrate surface of which the plurality of single-stranded nucleic acid fragments have been immobilized, and in contact with the back of the substrate;

disposing a heater or a cooler in contact with the heat-conductive material;
and

providing a temperature controller for controlling the amount of heat flowing across the heater or cooler and the heat-conductive material to control the temperature of the heat-conductive material;

the detection being operated while the substrate standing bonded sandwichedly and the specimen standing in contact with the substrate surface are temperature-controlled through the temperature control of the heat-conductive material by the temperature controller during the operation of gene detection.

Claim 5 (withdrawn): The method according to claim 4, wherein, in a plurality of steps involved in the gene detection operation, said substrate and said specimen standing in contact with the substrate surface are temperature-controlled; and the temperature in the plurality of steps requiring temperature control is successively controlled by the temperature controller which utilizes said heater.

Claim 6 (withdrawn): The method according to claim 4, wherein, in a plurality of steps involved in the gene detection operation, said substrate and said specimen standing in contact with the substrate surface are temperature-controlled; and the temperature in the plurality of steps requiring temperature control is successively controlled by the temperature controller which utilizes said cooler.

Claim 7 (withdrawn): The method according to claim 4, wherein, as said heat-conductive material, which is utilized for the temperature control the substrate

and of the specimen standing in contact with the substrate surface, a heat-conductive material is used which is formed of any one of a metal and a resin or a composite of these two or more.

Claim 8 (withdrawn): A method for detecting genes by utilizing as a detector a substrate to the substrate surface of which a plurality of nucleic-acid probes containing single-stranded nucleic acid fragments having a complementary sequence in respect to a target DNA have been immobilized in order that the target DNA contained in a specimen is detected according to hybridization; the method comprising:

disposing a heat-conductive material on the surface of the substrate to the substrate surface of which the plurality of single-stranded nucleic acid fragments have been immobilized, facing, and in contact with, the substrate surface, partly leaving a space for feeding the specimen thereinto;

disposing a heater or a cooler in contact with the heat-conductive material;
and

providing a temperature controller for controlling the amount of heat flowing across the heating means or cooling means and the heat-conductive material to control the temperature of the heat-conductive material;

the detection being operated while the specimen fed into the space and the substrate surface, which are in contact with the heat-conductive material, being temperature-controlled through the temperature control of the heat-conductive material by the temperature controller during the operation of gene detection.

Claim 9 (withdrawn): The method according to claim 8, wherein, in a plurality of steps involved in the gene detection operation, said substrate and said specimen standing in contact with the substrate surface are temperature-controlled; and the temperature in the plurality of steps requiring temperature control is successively controlled by the temperature controller which utilizes said heater.

Claim 10 (withdrawn): The method according to claim 8, wherein, in a plurality of steps involved in the gene detection operation, said substrate and said specimen standing in contact with the substrate surface are temperature-controlled; and the temperature in the plurality of steps requiring temperature control is successively controlled by the temperature controller which utilizes said cooler.

Claim 11 (withdrawn): The method according to claim 8, wherein, as said heat-conductive material, which is utilized for the temperature control of the substrate and the specimen standing in contact with the substrate surface, a heat-conductive material is used which is formed of any one of a metal and a resin or a composite of these two or more.

Claims 12-15 (canceled).

Claim 16 (previously presented): The system according to claim 2, wherein said heat conduction member is formed of metal, resin or a composite of metal and resin.

Claim 17 (previously presented): A reaction unit for use in the system for reaction according to claim 1.

Claim 18 (previously presented): A heat conduction adapter for using a heater with a plurality of holes for microtubes in temperature control for a nucleic acid probe array substrate, the heat conduction adapter comprising:

- a face provided with a plurality of legs having the same shape as that of the microtubes, and
- another face for contacting with a face of the nucleic acid probe array substrate or a cover forming a chamber with the nucleic acid probe array substrate, wherein the legs are fitted into the holes, thus bringing the heater into thermal contact with the nucleic acid probe array.